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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,709	01/09/2002	Kuo-Yu Chou	67,200-603	6454

7590 08/13/2003

TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

EXAMINER

LE, THAO X

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,709

Applicant(s)

CHOU ET AL.

Examiner

Thao X Le

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-24 and 29-39 is/are pending in the application.
- 4a) Of the above claim(s) 13-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Acknowledgement

1. Applicant's cancellation of claims 1-12 and 25-28 in Paper No. 8 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 29-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,016,000 to Moslehi in view of US 6,417,088 to Ho et al.

Regarding claim 29, Moslehi discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device comprising the steps of: providing a substrate, fig. 15, thereafter configuring substrate to comprise a wiring bond pad to comprises a

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single metal layer, step 144 fig. 6B, wherein single metal layer does not share single metal layer with any other material, thereafter positioning at least one IC device below wiring bond pad to thereby conserve IC space and improve wiring bond pad efficiency as a result of configuring wiring bond pad to comprise a single metal layer, column 1 line 10-25, thereafter locating single metal layer above a plurality of intermetal dielectric (IMD) layer, step 122 fig. 6B, and thereafter locating at least one IC device below plurality of IMD layer, fig. 15, wherein single metal layer comprises a metal-8 layer.

But, Moslehi does not expressly disclose locating a buffer and bonding layer immediately above single metal layer.

However, Ho reference discloses the method for forming a wiring bond pad 30, column 3 line 10, comprises a aluminum buffer layer 52, fig. 6, column 4 line 1, and bonding layer 60, column 4 line 53, immediately above single metal layer 30. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to combine the buffer layer and bonding layer teaching of Ho with Moslehi, because it would have increased the adhesion between the bond pad and bonding layer as taught by Ho, column 4 line 30-32.

Regarding claims 30-31, Moslehi discloses the method wherein the plurality of IMD layers comprises at least IDM-1 to IDM-7 layers, fig. 15 and step 132 fig. 6B, wherein the metal-8 layers comprises a copper layer, step 130 fig. 6B.

Regarding claims 32, 38-39 Moslehi discloses a method for forming a wiring bond pad utilized in wire bonding operation on an integrated circuit (IC) device comprising the steps of: providing a substrate, fig. 15, thereafter configuring substrate to comprise a wiring bond pad to

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comprises a single metal layer, step 144 fig. 6B, wherein single metal layer does not share single metal layer with any other material, thereafter locating at least one IC device below wiring bond pad to thereby conserve IC space and improve wiring bond pad efficiency as a result of configuring wiring bond pad to comprise a single metal layer, column 1 line 10-25, thereafter locating a single metal layer above a plurality of IML layers, wherein plurality of IMD layers comprises at least IMD-1 to IMD-7 layers, fig. 15 and step 132 fig. 6B, and thereafter locating at least one IC device below plurality of IMD layer, fig. 15, wherein single metal layer comprises a metal-8 of copper, step 130 fig. 6B.

But, Moslehi does not expressly disclose locating a buffer and bonding layer immediately above single metal layer comprises a layer having a thickness in a range of and including 10KA°-20KA°.

However, Ho reference discloses the method for forming a wiring bond pad 30, column 3 line 10, comprises a aluminum buffer layer 52, fig. 6, column 4 line 1, and bonding layer 60, column 4 line 53, immediately above single metal layer 30. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to combine the buffer layer and bonding layer teaching of Ho with Moslehi, because it would have increased the adhesion between the bond pad and bonding layer as taught by Ho, column 4 line 30-32.

With respect to the thickness, Ho reference discloses the method for forming a wiring bond pad, fig. 6 comprises a aluminum buffer layer 52, column 3 line 3, and bonding layer 60, column 4 line 53, immediately above metal layer 30, wherein the aluminum buffer layer having the thickness in a range of 5000A°, column 4 line 35.

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Accordingly, it would have been obvious to one of ordinary skill in art to use buffer layer 52 teaching of Ho in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 33-37, Moslehi does not disclose the single metal layer comprises copper layer having a thickness of approximately 10-18Å.

However, Moslehi discloses the copper single metal can be formed with thinner thickness, column 2 lines 7-15 and line 31. Accordingly, it would have been obvious to one of ordinary skill in art to use teaching of Moslehi in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. See *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is 703-306-0208. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Thao X. Le
August 5, 2003



LONG PHAM
PRIMARY EXAMINER